

FOR IMMEDIATE RELEASE

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Subject: Scientists Use Medical Imaging to Diagnose Health of Estuaries

High-tech imaging, normally used by physicians to diagnose medical problems of patients, is helping marine scientists evaluate the ecological health of the animal communities living in coastal sediments. While Computer Aided Tomography (CAT) imaging has been recently used in other non-health related sciences such as paleontology and archaeology, this is the first time marine ecologists have used this technology to study environmental pollution problems, as reported in a recent article in the journal Ecological Applications.

South County Hospital in Wakefield, Rhode Island, is making its facility and staff available to scientists at the U.S. Environmental Protection Agency (EPA), Office of Research and Development (Atlantic Ecology Division) located in Narragansett, Rhode Island. South County Hospital is a convenient site for this work since it is only seven miles from the Atlantic Ecology Division. Under a funding agreement between EPA and South County Hospital, the Hospital has offered to scan sediment cores at a reduced cost during off hours when no patients are scheduled. Lenor Durand, Manager of the hospital's Diagnostic Imaging Department said, "We are always willing to share our technology with the community. By helping others, we are also able to expand our knowledge and increase our skills through such different applications."

EPA scientists in Narragansett study the effects of contaminants and other stressors on the coastal environments and watersheds of the Atlantic seaboard. One measure to assess the health and integrity of these ecosystems is to identify and count the many bottom dwelling organisms living in the sediment. These animals, which are a major food source for many fish, create intricate tubes and tunnels in the sediment to depths as much as three feet. A healthy sediment is characterized by a high degree of tube and tunnel formation and, by contrast, an impacted sediment has fewer large, deep burrowing animals and their associated tubes and tunnels. Traditionally, sediment health is determined by collecting, identifying and counting these organisms but this procedure requires specialized training and is labor intensive and time consuming.

CAT imaging offers a rapid cost effective alternative to this traditional

method by quantifying the burrows and tunnels in sediment cores.

Scientists first collect intact mud cores from an estuary using cylindrical plastic tubes pushed into the sediment. The cores are tightly sealed at the top and bottom and transported to the hospital for CAT imaging. The resulting image data are stored on magnetic tape and analyzed on a personal computer at the EPA laboratory. A three-dimensional image of tubes and tunnels within the core can be quantified, and these measures can be used to identify, monitor and assess the effects of human activities on sediment habitats. Since medical CAT imaging scanners are located throughout the world, this technique could be widely available for environmental managers to evaluate the health of sediments.

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Photos available: Please contact Ken Perez at (401) 782-3052